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Coordination of Breast Cancer Care Between Radiation Oncologists and Surgeons: A Survey Study

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Abstract

Purpose—To assess whether radiation oncologists and surgeons differ in their attitudes regarding the local management of breast cancer, and to examine coordination of care between these specialists.

Methods and Materials—We surveyed attending surgeons and radiation oncologists who treated a population-based sample of patients diagnosed with breast cancer in metropolitan Detroit and Los Angeles. We identified 419 surgeons, of whom 318 (76%) responded, and 160 radiation oncologists, of whom 117 (73%) responded. We assessed demographic, professional, and practice characteristics; challenges to coordinated care; and attitudes toward management in three scenarios.

Results—92.1% of surgeons and 94.8% of radiation oncologists indicated access to a multidisciplinary tumor board. Nevertheless, the most commonly identified challenge to radiation oncologists, cited by 27.9%, was failure of other providers to include them in the treatment decision process early enough. Nearly half the surgeons (49.7%) stated that few or almost none of the breast cancer patients they saw in the past 12 months had consulted with a radiation oncologist before undergoing definitive surgery. Surgeons and radiation oncologists differed in their

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recommendations in management scenarios. Radiation oncologists were more likely to favor radiation than were surgeons for a patient with 3/20 lymph nodes undergoing mastectomy ($p = 0.03$); surgeons were more likely to favor more widely clear margins after breast conservation than were radiation oncologists ($p = 0.001$).

Conclusions—Despite the widespread availability of tumor boards, a substantial minority of radiation oncologists indicated other providers failed to include them in the breast cancer treatment decision-making process early enough. Earlier inclusion of radiation oncologists may influence patient decisions, and interventions to facilitate this should be considered.

Keywords

Breast cancer; Radiation oncology; Coordination of care; Surgery; Survey

Introduction

Cancer management in the modern era commonly involves the use of multiple treatment modalities by providers from different specialties. Providers from different oncologic disciplines may have different perspectives and interpretations of the increasingly complex evidence base. The manner by which various specialists communicate and become involved in patient care may, therefore, affect patient decisions and the quality of care ultimately received. Consequently, interest has grown in assessing and improving the coordination and organization of cancer care delivery (1).

In breast cancer care, multidisciplinary involvement may be particularly important (2). As Keating and colleagues note, “Because many women defer to their physicians when making decisions about breast cancer treatment, the attitudes and beliefs of providers with whom they discuss surgical options may influence treatments. Such attitudes and beliefs may differ by physician specialty” (3). Breast cancer patients face many decisions regarding approaches to obtain local control of breast cancer, including extent of the primary breast surgery, management of the axilla, and whether to receive adjuvant radiotherapy. It is possible that radiation oncologists and surgeons may differ in their attitudes regarding some of these issues.

Patients with newly diagnosed breast cancer routinely see surgeons, but the frequency and timing of consultation with radiation oncologists has not been well characterized. Therefore, this study seeks to answer several questions. First, when do radiation oncologists become involved in the care of patients with newly diagnosed breast cancer? Second, do radiation oncologists feel that they are involved in the care of the breast cancer patient at the appropriate time in the decision-making process? Third, are certain provider or practice characteristics associated with more coordinated multidisciplinary care? And finally, do surgeons and radiation oncologists have different opinions regarding optimal management in certain common breast cancer scenarios?

Methods and Materials

We performed a survey of attending surgeons and radiation oncologists who treated a large population-based sample of patients diagnosed with breast cancer, July 2005 through February 2007, in the metropolitan areas of Detroit and Los Angeles.

Details of the patient study have been published elsewhere (4–6). In brief, we enrolled women 20 to 79 years old who were reported to the Surveillance, Epidemiology, and End Results (SEER) registries of metropolitan Los Angeles and Detroit as having been diagnosed with breast cancer between June 2005 and February 2007. We excluded patients with Stage 4 breast cancer, those who died before the survey, those who could not complete a questionnaire in English or Spanish, and Asian women in Los Angeles (because of enrollment in other studies). Latinas (in Los Angeles) and African-Americans (in both Los Angeles and Detroit) were oversampled, and the eligible patient population included approximately 70% of the Latina and African-American patients and approximately 30% of non-Latina white patients diagnosed in these two metropolitan areas during the study period. A modified Dillman survey method was used to encourage survey response (7). Patients completed a survey approximately 9 months after diagnosis (96.5% by mail and 3.5% by phone), and this information was merged to SEER clinical data. The response rate was 73.1% ($n = 2,290$). The study protocol was approved by the Institutional Review Boards of the University of Michigan, University of Southern California, and Wayne State University.

Using information from the patient surveys and from pathology records obtained by SEER, an attending surgeon was identified for 98.9% of the patient sample. Of the 1,537 patients who received radiotherapy, 62.3% also identified their attending radiation oncologists. These physicians were mailed a packet containing a letter of introduction, a survey, and a \$40 subject fee approximately 14 months after the start of the patient survey. We again used a modified version of the Dillman method to optimize response (7). We identified 419 surgeons, of whom 318 returned completed questionnaires (response rate 76%). We identified 160 radiation oncologists, of whom 117 returned completed questionnaires (response rate 73%).

Measures

The physician survey measures were developed on the basis of the literature, our prior research, and a conceptual model. The surgeon survey included measures of physicians' professional and personal characteristics (years in practice and sex); practice characteristics, such as the level of specialization (percent of total practice devoted to breast cancer); teaching status (presence of residents in the practice); and patient socioeconomic status (percent of patients covered by Medicaid). The surgeon survey also included items assessing the proportion of patients with newly diagnosed breast cancer for whom the surgeon discussed the treatment plan with a radiation oncologist before treatment and the proportion who consulted with a radiation oncologist before definitive surgery. Surgeons were also asked how large a problem it was to arrange to discuss the treatment plan at a tumor board before surgery and arranging to discuss the treatment with a radiation oncologist before the definitive surgery.

The radiation oncologist survey included parallel measures of provider demographics and practice characteristics and context. It asked in what proportion of breast cancer patients was the case discussed with the surgeon before the definitive surgery, in what proportion was the case discussed with a medical oncologist or plastic surgeon before radiotherapy was initiated, and what proportion were seen in consultation before definitive surgery. Radiation oncologists were also asked how large a problem it was arranging to discuss the treatment plan at a tumor board before the final treatment decisions, arranging to discuss the treatment plan with a medical oncologist or plastic surgeon, arranging to discuss the treatment plan with the surgeon after the definitive surgery, and other providers not including the radiation oncologist in the patient's treatment decision process early enough.

Both surgeons and radiation oncologists were also asked to consider two patient scenarios, one involving a patient who elected mastectomy and the other involving a patient who elected breast conservation. The first scenario was used to contrast specialists' attitudes regarding postmastectomy radiotherapy. The second scenario was used to contrast specialists' attitudes toward surgical margins after breast-conserving surgery and regarding the need for axillary node dissection in the face of a sentinel lymph node micrometastasis.

Analysis

We first described characteristics of the surgeon and radiation oncologist study samples. Next, we described the distribution of responses to the items assessing radiation oncologist participation in patient treatment. We constructed a scale assessing challenges to multidisciplinary involvement by the radiation oncologist by taking the mean of responses to five items asking radiation oncologists how large a problem it was “arranging to discuss your patient's treatment plan at a tumor board prior to the final treatment decisions,” “other providers not including you in the patient's treatment decision process early enough,” “arranging to discuss the treatment plan with the surgeon after the definitive surgery,” “arranging to discuss the treatment plan with a medical oncologist,” and “arranging to discuss the treatment plan with a plastic surgeon.” Scores on this scale could range from 1 to 5 (where 1 was anchored at “no problem,” 3 at “somewhat of a problem,” and 5 at “a big problem”) and actually ranged from 1 to 3.8. Cronbach's alpha was 0.75, indicating high internal consistency in this scale (8). We then built a multivariate model that regressed this scale on physician demographic and practice characteristics. Specifically, the independent variables examined were radiation oncologist years in practice (0–10, 11–25, 26 or more), radiation oncologist sex (male or female), radiation oncology practice teaching status (yes or no), percent of breast cancer patients in the radiation oncologist's personal practice (1–20%, 21–35%, 36% or more), and percent of the radiation oncologist's patients with Medicaid insurance (15% or less vs. more than 15%). Finally, we described the distribution of responses to the scenarios and examined associations between provider specialty and response with chi-squared testing.

Results

Respondent characteristics

Table 1 describes the demographic and practice characteristics of the responding physicians. Nearly one-fifth of the surgeons (17.5%) and one-third of the radiation oncologists (30.1%) were female. Almost half of each group (48.1% of surgeons and 41.9% of radiation oncologists) were part of teaching programs. Most radiation oncologists (76.5%) devoted between 15% and 49% of their total practice to breast cancer, and another 14.8% devoted 50% or more, but nearly half of the surgeons (46.1%) devoted less than 15% of their total practice to breast cancer. Almost all surgeons (92.1%) indicated access to a meeting (e.g., a tumor board) where different specialists discussed the plan for cancer patients before final treatment decisions, and among these, 64.7% indicated that these meetings occurred weekly, 18.0% twice a month, and 17.0% once a month. Similarly, almost all radiation oncologists (94.8%) indicated access to a meeting (e.g., a tumor board) where different specialists discussed the plan for cancer patients before final treatment decisions, and among these, 77.5% indicated that these meetings occurred weekly, 14.4% twice a month, and 8.1% once a month.

Table 2 details the frequency of up-front radiation oncology consultations and discussions between radiation oncologists and other providers. Nearly half of the responding surgeons (49.7%) stated that few or almost none of the breast cancer patients they saw in the past 12 months had consulted with a radiation oncologist before undergoing definitive surgery. Only a quarter of the surgeons (25.1%) reported discussing two thirds or more of their breast cancer patients' cases with a radiation oncologist before definitive surgery. Similarly, nearly half of the radiation oncologists (49.6%) also reported that few or almost none of the breast cancer patients they treated had consulted with them before definitive surgery, and about a quarter (26.3%) reported discussing two thirds or more of their breast cancer cases with the surgeon before definitive surgery. Only 39.1% of surgeons and 37.9% of radiation oncologists indicated that their practice participated regularly in same-day appointments for new patients with breast cancer to meet with different clinician specialists before definitive surgery. Over half of the responding radiation oncologists (57.0%) reported discussing treatment plans with a medical oncologist before commencing radiotherapy in two thirds or more of cases.

Table 3 presents responses regarding challenges faced by the responding providers. The most commonly identified challenge to radiation oncologists, cited by 27.9% of respondents, was failure of other providers to include them in the treatment decision process early enough. Other challenges reported by at least one fifth of respondents included arranging to discuss patients' treatment plans with a plastic surgeon (21.9%), arranging to have mammogram images reviewed by a radiologist (21.2%), and arranging to have pathology slides reviewed by a pathologist (25.0%). In addition, 19.3% of respondents reported challenges with arranging for patients to meet with practitioners such as social workers or counselors.

The mean rating for challenges to multidisciplinary involvement was 1.7, and the scale ranged from 1 to 3.8. In a multivariate analysis examining the relationship between radiation

oncologist age, radiation oncologist sex, radiation oncology practice teaching status, percent of Medicaid patients in the radiation oncologist's practice, and percent of breast cancer patients in the radiation oncologist's practice and challenges to multidisciplinary involvement, we found no significant associations.

Surgeon and radiation oncologist attitudes

Table 4 summarizes the attitudes of surgeons vs. radiation oncologists in two scenarios, one about the role of postmastectomy radiation therapy, and another about margin status and the need for axillary dissection in the setting of breast conservation. Details of the scenarios are presented in the table itself. In the scenario asking about postmastectomy radiotherapy, radiation oncologists were more likely to favor the use of radiotherapy than were surgeons ($p = 0.03$). In the scenario asking about margin width in the setting of breast conservation, radiation oncologists were more likely to accept less widely clear surgical margins than were surgeons ($p = 0.001$). After a positive sentinel node biopsy result, similar proportions of surgeons (79.8%) and radiation oncologists (82.6%) favored additional surgery, but surgeons were more likely to strongly recommend axillary node dissection (42.0% vs. 33.0%, $p = 0.04$).

Discussion

We examined perspectives about the care of patients with breast cancer by surveying radiation oncologists and surgeons responsible for locoregional management of breast cancer in a population-based sample of patients from two metropolitan areas. We found that radiation oncologists were not involved in breast cancer treatment decision making before definitive surgery in a substantial proportion of cases. Nearly half of both radiation oncologists and surgeons reported that collaborative treatment decision making before surgery occurred for few or none of their patients. Additionally, a substantial minority of radiation oncologists reported barriers to collaborative treatment planning and access to key clinical information.

We also found differences of opinion when radiation oncologists and surgeons considered several common scenarios. Radiation oncologists were more likely to advocate for postmastectomy radiation therapy for a patient with N1 disease, and surgeons were more likely to require wider margins of resection for breast-conserving surgery. This is consistent with previous studies that have shown that specialists tend to favor the treatments they themselves deliver (9). The finding of systematic differences between radiation oncologists and surgeons in their attitudes toward locoregional management approaches suggests that the observed relative lack of early participation of radiation oncologists may be important for some patient groups, particularly those who are undecided about their choice of local therapy or those who have concerns about the side effects of radiation therapy.

Few previous studies have assessed the role of preoperative multidisciplinary consultation with radiation oncologists. In a retrospective cohort study of 1,188 women diagnosed with early breast cancer in Washington state in 1994 to 1995, 29% of patients were found to have consulted with a radiation oncologist before surgery (10). Among patients who received either breast-conserving surgery with radiotherapy and those who received mastectomy,

those who had a preoperative consultation with a radiation oncologist had odds of receiving breast conservation that were 6.7 times ($p < 0.001$) greater than those who did not. Although the authors acknowledged that women who have already chosen breast conservation may be encouraged to see a radiation oncologist before undergoing surgery, they also raised the possibility that preoperative radiation oncology consultations might affect patients' decision-making processes.

In the modern era, the mechanism by which early involvement by radiation oncologists might improve the decision process is likely to be more subtle than in earlier studies conducted when breast conservation was less well established. Although we have clearly documented here that preoperative consultation with radiation oncologists was uncommon in this population, we have demonstrated in our previous work that these patients received recommendations from their surgeons regarding whether to pursue breast conservation or mastectomy that seemed to be generally appropriate (11). Of the 13.4% of patients who underwent mastectomy following the recommendation of a surgeon, most reported having contraindications to breast conservation, and those who sought second opinions were very likely to receive the same recommendation. However, we also found that 8.8% of patients underwent mastectomy based on a patient-directed decision; at least some of these patients might have been influenced by preoperative involvement by a radiation oncologist. We have also demonstrated that the desire to avoid radiation is strongly correlated with the choice of mastectomy (12, 13), and it is possible that an improved understanding of the risks and benefits of radiotherapy obtained through a preoperative radiation oncology consultation could influence decision making for some of these patients. Moreover, increased awareness of the role of postmastectomy radiation therapy that might be obtained in a preoperative consultation might have important consequences for those patients, who, had they known that they would likely receive radiotherapy regardless of surgical procedure, might have elected breast conservation rather than mastectomy. Early consultation with a radiation oncologist might also alter the number of patients undergoing mastectomy after attempting breast conservation. This occurred in 8.8% of patients in our previous study. Although tumor at an inked margin is regarded as unacceptable, there is no consensus on the need for more widely clear lumpectomy margins. Thus, attitudes regarding the adequacy of the surgical margin after lumpectomy are clearly an important issue (14). Our finding that radiation oncologists are less conservative than surgeons with regard to acceptable margin width could mean that earlier involvement of radiation oncologists in decision making might reduce re-excision rates after breast-conserving surgery (and possibly even mastectomy rates).

We recognize that multidisciplinary involvement in decision making may take place in forms other than direct preoperative consultation with a radiation oncologist, including multidisciplinary tumor board discussions of cases (15). The vast majority of respondents in this study reported access to tumor board meetings at which they could discuss cases with providers from different specialties. These sorts of conferences may indeed have utility (16), although multi-disciplinary discussions do not necessarily improve the overall quality of decision making (17–19). Still, it is concerning that despite this widespread access to multidisciplinary tumor boards, a substantial minority of the radiation oncologists

responding to this survey perceived as problematic the failure to include them early enough in the decision-making process.

This study has several strengths, including its population-based strategy to identify surgeons and medical oncologists treating breast cancer in the two communities considered and the high survey response rates. It also has certain weaknesses. First, the study was based in two large metropolitan areas, and its findings cannot be extrapolated to more rural settings. However, if there are challenges to multidisciplinary care in densely populated urban settings, it is likely that they also exist in rural settings, where access to radiation oncologists may be more difficult. The fact that we over-sampled minority patients may also limit the generalizability of our findings if our respondents were more likely than other providers to practice in underprivileged settings. There may also be biases related to the fact that treating radiation oncologists were not identified by all patients. Finally, the study relies upon physician reports of challenges, which may not correlate with patient experiences. Nevertheless, we believe there is substantial value in assessing the attitudes of providers, inasmuch as many of the potential challenges we examined would not have been apparent to patients and cannot easily be measured in other ways.

Ultimately, the findings of this study serve to highlight a potential area for quality improvement in breast cancer care. Despite the widespread availability of tumor boards for case discussion, a substantial minority of radiation oncologists indicated a problem with other providers failing to include them in the decision-making process early enough. Increased awareness of the systematic attitudinal differences between surgeons and radiation oncologists demonstrated in this study may help motivate surgeons to consult with their radiation oncology colleagues earlier, in particular by referring patients who are undecided about whether to pursue mastectomy or breast conservation, those who express concerns about radiotherapy, and those with larger tumors or evidence of nodal involvement at high risk for needing post-mastectomy radiotherapy for preoperative consultation with a radiation oncologist before undergoing surgery. Measures to increase the availability of same-day multidisciplinary clinics for breast cancer patients (20) may allow for improved participation of radiation oncologists in these patients' complex treatment decision-making process. In addition, the attitudinal differences between surgeons and radiation oncologists regarding margin width, the use of axillary dissection, and the need for postmastectomy radiotherapy suggest a role for the development of institutional guidelines in these areas or the adoption of national guidelines to avoid provider-based variations in care. Ultimately, if such efforts to increase multidisciplinary involvement before surgery are successful, patients may benefit from exposure to a variety of viewpoints before proceeding with definitive local therapy decisions, making their decision-making process more fully informed and potentially more in accord with their underlying preferences.

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Table 1
Respondent characteristics

	Surgeons (n = 318)	Radiation oncologists (n = 117)
Mean years in practice	18.5	18.4
Sex		
M	259 (82.5%)	79 (69.9%)
F	55 (17.5%)	34 (30.1%)
Race		
White	199 (62.5%)	61 (52.1%)
Black	15 (5.0%)	4 (3.4%)
Asian	66 (20.8%)	37 (31.6%)
Hispanic	24 (7.6%)	3 (2.6%)
Other/missing	13 (4.1%)	12 (10.3%)
Teaching practice	153 (48.1%)	49 (41.9%)
Weekly work hours in patient care		
40 hours	78 (25%)	64 (55%)
41–60 hours	130 (41%)	47 (40%)
>60 hours	108 (34%)	6 (5%)
% of practice devoted to breast cancer		
50%	52 (16.5%)	17 (14.8%)
15–49%	119 (37.7%)	88 (76.5%)
<15%	144 (45.7%)	10 (8.7%)
% of breast cancer patients seen for second opinions		
>25%	13 (4.1%)	0
10–25%	58 (18.4%)	14 (12.1%)
<10%	244 (77.5%)	102 (87.9%)
Access to tumor board	292 (92.1%)	110 (94.8%)
Same-day multidisciplinary clinics	124 (39.1%)	44 (37.9%)
% of patients with Medicaid		
<5%	73 (25.8%)	14 (14.0%)
5–15%	124 (43.8%)	50 (50.0%)
>15%	86 (30.4%)	36 (36.0%)

Table 2
Distribution of physician responses to items related to frequency and timing of radiation oncologist participation

Responses	Share of patients		
	Few or almost none	1/3 to 1/2	2/3 or more
Surgeon responses			
Share of patients for whom surgeon discussed plan with radiation oncologist before definitive surgery	43.5	31.4	25.1
Share of patients who consulted with a radiation oncologist before definitive surgery	49.7	31.3	19.0
Radiation oncologist responses			
Share of patients seen in consultation before definitive surgery	49.6	36.5	13.9
Share of patients for whom treatment plan was discussed with surgeon before definitive surgery	39.5	34.2	26.3
Share of patients for whom radiation oncologist discussed treatment plan with medical oncologist before initiating radiotherapy	9.7	33.3	57.0
Share of patients for whom radiation oncologist discussed treatment plan with plastic surgeon before initiating radiotherapy	78.8	16.8	4.4

Table 3
Distribution of physician responses to items related to challenges to multidisciplinary involvement by radiation oncologist

Thinking about your patients in the past 12 months with newly diagnosed breast cancer, how big of a problem was....	% indicating somewhat of a problem or more
Surgeon responses	
Arranging to discuss the treatment plan at a tumor board before the definitive surgery	12.5
Arranging to discuss the treatment plan with a radiation oncologist before the definitive surgery	6.0
Radiation oncologist responses	
Other providers not including you in the patient's decision process at an early enough point	27.9
Getting pathology specimens that were collected by another institution reviewed by your pathologist	25.0
Arranging to discuss the treatment plan with a plastic surgeon	21.9
Getting mammogram images that were taken at another institution reviewed by your radiologist	21.2
Arranging for your patients to meet with practitioners such as a social worker or counselor	19.3
Getting mammography reports for your first consultation	14.8
Arranging to discuss your patient's treatment plan at a tumor board before the final treatment decisions	13.9
Arranging to discuss the treatment plan with the surgeon after the definitive surgery	8.8
Arranging to discuss the treatment plan with a medical oncologist	6.1
Getting pathology reports for your first consultation	3.5

Comparison of surgeon and radiation oncologist responses to locoregional breast cancer management scenarios

Table 4

Scenario 1: A 60-year-old woman presents with a 3-cm mass in the upper outer quadrant of a large breast. A core biopsy shows Grade 3 infiltrating ductal carcinoma, ER/PR negative, Her-2 negative. The patient chooses to receive a mastectomy. This yields a 3.5-cm tumor resected with negative margins and metastases in 3/20 lymph nodes. What is your recommendation?						
	Strongly recommend PMRT	Moderately recommend PMRT	Weakly recommend PMRT	Weakly recommend no further treatment	Moderately recommend no further treatment	Strongly recommend no further treatment
Surgeons	30.1	25.6	8.7	4.5	16.4	14.7
Radiation oncologists	37.7	34.0	9.4	2.8	12.3	3.8
Scenario 2: A 60-year-old woman presents with a 0.8-cm mass in the upper outer quadrant of a large breast. A core biopsy shows Grade 3 infiltrating ductal carcinoma, ER/PR negative, Her-2 negative. The patient receives lumpectomy and sentinel node biopsy. She plans to receive adjuvant radiation therapy. What negative margin width precludes the need for re-excision?						
	Not on ink			>5mm	>1cm	<i>p</i>
Surgeons	11.2			27.9	18.9	0.001
Radiation oncologists	16.5			20.9	6.1	
Intraoperative exam of a sentinel node is negative. Final pathology report describes a 1.6-cm, Grade 3 infiltrating ductal carcinoma, ER/PR negative, Her-2 negative, with widely negative margin. The one sentinel node removed had a 0.6-mm metastasis detected by hematoxylin and eosin staining. What is your recommendation?						
	Strongly recommend ALND	Moderately recommend ALND	Weakly recommend ALND	Weakly recommend no further axillary surgery	Moderately recommend no further axillary surgery	Strongly recommend no further axillary surgery
Surgeons	42.0	33.3	4.5	2.9	9.6	7.7
Radiation oncologists	33.0	43.5	6.1	7.0	7.8	2.6

Abbreviations: ER = estrogen receptor; PR = progesterone receptor; Her-2 = human epidermal growth factor receptor 2; PMRT = postmastectomy radiotherapy; ALND = axillary lymph node dissection.